CONDIT DAM HYDROELECTRIC PROJECT
OPERATIONS PLAN

EXHIBIT A

Exhibit A is a description of the project. This exhibit need not include information on project works maintained and operated by the U.S. Army Corps of Engineers, the Bureau of Recreation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:

(1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project.

Refer to Table A-1 for Condit Project Data in tabular form.

CONDIT DAM

Condit Dam is located on the White Salmon River near White Salmon, Washington. The dam is a concrete gravity structure 125 ft high and 471 ft long and includes a 250 ft long spillway including 10 ft high 167 ft long, Obermeyer gate, five 10 ft by 10 ft radial gates and two 6 ft slide gates, a gated intake structure, diversion tunnel and two low level sluice gates.

The dam is founded in a narrow steep canyon on sound basalt rock which has no significant structural discontinuities. Foundation drainage was installed during construction of the dam utilizing a zone of crushed rock installed parellel to and 6 to 12 ft from the upstream face. Eight tile pipes were embedded in the dam leading from the crushed rock drain to the downstream face of the dam. In 1971 and 1972 additional drainage was provided by drilling 13 drains into the sluiceways and 6 drains into the diversion tunnel to provide drainage in the west spillway and deep spillway sections.

The diversion tunnel is located within the west abutment and was constructed for use during the construction of the dam. The tunnel was plugged after the completion of the project in 1913 and now serves as part of the drainage system for the dam's foundation. The tunnel is approximately 16 ft wide and 9 ft high near the entrance and 18 ft wide and 7.5 ft high near the concrete plug at the upstream end.

The dam contains two low level sluiceways located near the base, with a centerline elevation at 180.75. These sluice gates were used during the original construction of the dam and have not been operated since then. The sluiceways are closed by cast iron gates located on the upstream face of the dam. The operators for these gates are located on the crest of the dam, in the west end of the intake gate house. Metal doors over the downstream ends of the sluiceways keep debris out during periods of high tailwater.

The spillway section is 250 ft long and includes vertical lift gates, radial gates, and a 10 foot high Obermeyer gate for reservoir elevation control. A concrete operating deck at elevation 297.5 is located over the gated section of the spillway.

A 6 foot wide timber vertical lift gate is located at each end of the spillway. The east gate, located adjacent to the intake structure, is 12 ft high with an ogee crest at elevation 283.0.

There are five 10 ft by 10 ft radial gates numbered 1 through 5 from east to west, located at the east end of the spillway. The spillway ogee crest elevation at these gates is 285.0. The two eastern-most gates (No 1 and No 2) are operated simultaneously by a single electric motor. These gates can be operated from a station on the spillway deck or remotely from the powerhouse or from the Portland Dispatch Center approximately 60 miles west of the Condit Project in Portland, Oregon. The three remaining radial gates (No 3, 4 and 5) are locally operated by the use of a motorized portable operator from the spillway deck.

The east vertical lift gate, radial gates 1, 2 and 3, and half of radial gate 4 discharge down the spillway ogee to a raised apron or chute section along the east bank just below the 13.5 foot wood stave pipeline (See Exhibit F, Figure F-1). The chute portion of this spillway is approximately at elevation 241.0. The remaining part of radial gate 4, radial gate 5, and a portion of the flashboards discharge down a deep section spillway with a toe elevation of approximately 176.5, near the middle of the dam. The remainder of the flashboard sections discharge down the spillway with the toe elevations varying between 232.0 and 262.5. The west vertical lift gate discharges down a separate ogee section with a toe elevation of 262.5 at the west abutment. (See Exhibit F – Sheet F-2 & F-5).

The flowline intake structure is an integral part of the dam located adjacent to the left abutment. The intake configuration includes five 9.5 ft square openings equipped with individually controlled timber slide gates. These gates have screw type operators which can be operated individually or in pairs utilizing an electric motor. A gate house consisting of corrugated metal and wood frame construction on three sides and a concrete wall on the upstream side encloses the intake gate operators. The face of the intake supports steel bar trash racks. The area above the intake, between the trash racks and slide gates, is decked with timber planks providing access to the trash racks. (See Exhibit F – Sheet F-1 & F-2).

The west end of the dam, extending between the right abutment and west slide gate, consists of a 90 ft concrete gravity section with a crest elevation of 297.5. The east end of the dam, between the intake and the left abutment, is considered to be a non-overflow section and consists of a concrete gravity section with crest elevation of 295.0 ft and a concrete wall extending to elevation 300.5.

Other project works located at the dam include:

A 20 kW propane fueled emergency power generator is located on the dam's east non-overflow section. This generator provides emergency power to the spillway taintor gates, the west slide gate and the timber intake gates in the event station service is lost at the dam.

A concrete block gage house is located at the east end of the intake structure. This structure houses water level sensing equipment which monitors the water level on the downstream side of the intake trash racks. The water level information is transmitted to a recorder located in the powerhouse.

A floating dock located on the reservoir east of the intake structure supports a 20 hp, 250 gpm vertical turbine pump. The pump, supporting dock, associated walkway, and anchorage are owned by the Mt. Adams Orchard Company and are used to provide irrigation water for acreage east of the Condit Project. Although within the Condit project boundary, these facilities are not part of the Condit Hydroelectric Project.

A log boom, attached at the left abutment adjacent to the intake racks, extends across the reservoir just upstream of the dam and is attached at the west end of the dam near the west vertical slide gate. This log boom serves as a safety barrier and also keeps large debris from accumulating on the trash racks or against the spillway gates and flashboards.

Immediately upstream of the intake structure is a floating fish rearing net pen. This facility consists of a dock approximately 30 ft square which supports a 20 ft square by 13 ft deep net pen. Other associated equipment located on the net pen dock and within an enclosure located on the dock area covering the intake structure includes a Nielsen automatic feeder, food supplies, hand nets and safety equipment. This net pen is used under a cooperative program between PacifiCorp, the Washington Department of Wildlife and the White Salmon Steelheaders to raise steelhead smolts for release into the lower White Salmon River. The net pen facility is owned by PacifiCorp, however, it is not part of the Condit Hydroelectric Project.

WATER CONVEYANCE SYSTEM

Water is conveyed from the intake structure at the dam to the powerhouse through a woodstave flowline, concrete surge tank and two penstocks.

The flowline is a timber-supported 13.5 ft diameter woodstave pipe located along the left (east) bank of the White Salmon River between the dam and the surge tank. The length of the flowline is approximately 5100 feet. It is supported by wooden saddles and steel circumferential ties anchored to horizontal and vertical timber supports. The vertical timbers and wooden saddles rest on concrete footings spaced approximately 10 feet on center throughout the length of the flowline. The existing flowline was constructed in 1962 to replace the original woodstave pipe. The flowline is supported by trestles at three locations between the intake and surge tank, where the terrain is very steep. These trestles are constructed of steel and are founded on concrete piers. Approximately 2,430 ft downstream from the dam (approximately the mid-point in the flowline) the flowline alignment bends nearly 90 degrees horizontally. Because of the severe angle at this location, the woodstave flowline transitions into a 67 ft long steel elbow section, and then back to woodstave after the alignment change. The steel elbow section of pipe is embedded in a concrete thrust block. Because of the transition of pipe materials and the severe alignment change, this location is commonly referred to as “Steel Bend”. The flowline transitions to steel pipe again approximately 10 ft upstream of the concrete surge tank. (See Exhibit G – Sheet G-3).

The reinforced concrete surge tank, is 40 ft in diameter and approximately 45 ft high. The top of the surge tank is at elevation 300.0 ft, 5 ft above the normal maximum reservoir water surface elevation. Incorporated within the surge tank is an ungated overflow vent and spillway which discharges back to the river just upstream of the powerhouse. Within the surge tank, the flowline bifurcates into two individual penstocks. Head gates for the individual penstocks are also located within the surge tank structure. (See Exhibit F-Sheet F-3).

Two 9 ft diameter, 650 ft long penstocks convey water from the surge tank to the powerhouse. One penstock is constructed of welded steel, and replaced the original woodstave penstock in 1962. The second penstock is woodstave, and replaced the original woodstave penstock in 1968. Both penstocks are above ground, for most of their length, supported on concrete saddles and restrained by individual concrete thrust blocks at approximately their mid-point. Prior to entering the powerhouse, both penstocks run below grade and bifurcate to serve the dual scroll cases for each turbine unit.

POWERHOUSE

The Condit Powerhouse is located on the east bank of the White Salmon River, and was constructed during the period 1911-1913. The powerhouse is approximately 150 ft long and 75 ft wide. The concrete building is a stepped high-bay design in elevation, rising to approximately 70 ft at the rear elevation (river side) and 35 ft at the front elevation.

The powerhouse contains three principal floor levels or decks. The tunnel deck provides access to the butterfly valves, relief valves and the lower portions of the turbine units. The main powerhouse floor, or turbine deck, is the largest and provides access to the turbine units and generators. Also on the turbine deck, located between the turbine generators are two independently driven exciters. The main step-up transformers are located on the transformer deck, which is located in the rear of the powerhouse above the turbine deck. General plant control panels and equipment are also located on the transformer deck. The oil circuit breakers are located on a platform above the transformer deck. The common generator bus and outgoing leads are above the oil circuit breakers.

The powerhouse is served by an electrically powered 40 ton bridge crane.

The powerhouse tailrace consists of a concrete lined outlet channel immediately downstream of the powerhouse, followed by a rectangular shaped open concrete channel which runs along the east bank of the river and ends in a large natural pool approximately 350 ft downstream of the powerhouse.

A 45 kW propane fueled emergency power generator is located outside and adjacent to the powerhouse to provide power for shutdown and restart of units should loss of station service occur.

EXHIBIT B

Exhibit B is a statement of project operation and resource utilization. If the project includes more than one dam with associated facilities, the information must be provided separately for each discrete development. The exhibit must contain:

(1) A statement whether operation of the powerplant will be manual or automatic, an estimate of the annual plant factor, and a statement of how the project will be operated during adverse, mean, and high water years.

The Condit Project operation is currently semiautomatic. PacifiCorp employs a resident operator and a maintenance man/relief operator to oversee daily operation and maintenance of the project. The generators are manually synchronized to the system by the operator. Once on line, operation control is accomplished remotely from the Portland Dispatch Center in Portland, Oregon, which is staffed 24 hours per day. The units are loaded to meet system demand consistent with the project environmental, recreational and other restraints. Portland Dispatch has the capability to remotely shutdown or vary the load on both units and can control two of the five spillway radial gates. These operations are the same during adverse, mean, and high water years.

The plant factor for the project based on 30 years of record is 0.62.

CURRENT PROJECT OPERATION

License Constraints:

License Article 28 requires a minimum discharge of 15 cfs from Condit Reservoir into the White Salmon River. This flow is normally provided by releases from the dam's easterly vertical slide gate.

Article 29 of the Condit license requires "between September 1 and October 15 of each year, the Licensee shall so regulate releases from the dam that fluctuations and river surface levels downstream from the powerhouse shall be no greater then 2.5 ft in any 24 hour period as measured by U.S. Geological Survey gaging station near Underwood, Washington". This requirement is to facilitate the operation of the U.S. Fish and Wildlife Service (USFWS) fish facility located 0.3 miles downstream of the Condit Powerhouse. PacifiCorp's Standard Operating Procedure (SOP) for the Condit Project directs the operators, in the event of a total plant trip, to open spillway gates No. 1 and No. 2 to maintain a sufficient discharge to minimize the river fluctuation.

Non-License Constraints:

The operation of the USFWS facility has been expanded to include some fish rearing activity on nearly a continuous basis. As a matter of cooperation, PacifiCorp has voluntarily extended the river level fluctuation restraints contained in Article 29 to essentially a constant mode of operation although, during periods of high runoff, the project cannot control the rate of river

elevation rise or fall. The SOP directs the operators to check with the Spring Creek National Hatchery, which oversees the operation of the USFWS facility, whenever it is necessary to schedule flows downstream of the Condit Powerhouse at or below 250 cfs.

Operation Mode:

The Condit Project is neither operated strictly as a run-of-river facility nor as a peaking facility. Its operation mode changesd periodically depending primarily upon changes in the inflow rates, seasonal recreation use and the need for peaking capacity.

During the 78 years of operation since the construction of the Condit Project, the reservoir has significantly "silted in" leaving approximately 665 acre-feet of usable storage. Historically, during periods when the available flow is at or above the level to efficiently load both units, the project has been operated at or near a full reservoir condition.

TABLE A-1 Condit Project Data – Existing/Proposed Modifications

Project Data	Existing
FERC Project/License Expiration	2342/Dec. 31, 1993
Location	White Salmon, WA
Stream Name	White Salmon River
Drainage area, square mile	386
Minimum flow, cfs	15
"Target" flow, cfs	
Bypass reach	
Below powerhouse	
Dam	
Type	Concrete gravity
Length, ft	471
Height, ft	125
Spillway length, ft	250
Spillway gates width & height, ft	Slide, 1 @ 6.0 x 12.0 1 @ 6.0 x 14.0 Taintor 5 @ 10.0 x 10.0
Obermeyer Gate	1 @ 167
Reservoir	
Name	Northwestern Lake
Surface area, acres	92
Usable storage capacity, acre feet	615 (elev 294.5-282)
Normal maximum elevation, ft*	295.0
Maximum operating elev, ft*	294.5
"Target" elevation range, ft*	
Minimum operating elevation, ft*	282.0
Water Conveyance	
Flowline	Woodstave
Diameter/length, ft	13.5/5100
Penstock	1- Steel, 1-Woodstave
Diameter/length, ft	9/650
Surge Tank	Concrete
Size, ft	40 dia. x 45 high

* Elevations given use PacifiCorp datum. Add 6.0 feet to convert to elevations per USC&GS mean sea level datum.

TABLE A-1 Condit Project Data – Existing/Proposed Modifications

Project Data	Existing	
Plant Data		
Plant capacity, kW	14,700 @ 167.8 ft	
Number of units	2	
Plant discharge, cfs	1,400	
Average annual gross gen, MWh	77,850 (1936-1989)	
Turbine Manufacture		
	TURBINE #2	TURBINE #1
	Allis Chalmers	American Hydro
Turbine rating, hp	9,000 @ 160 ft	1-,835 @ 160 ft
Max. turbine discharge, cfs	700	700
Type	Double Runner	Double Runner
	Horizontal Francis	Horizontal Francis
Speed, rpm	360	360
Turbine center line elevation, ft*	136.0	136.0
Generator Manufacturer	Allis Chalmers	
Generator Rating		
kW	7,200	
kVA	6,000	
Power factor	0.8	
Exciter	dc, 1 turbine driven 1 motor driven	
Transformer		
Unit 1		
Type	Single-phase	
Rating, kVA	3 @ 2, 000	
Voltage, volts	2,300	
	Unit 2	
Type	Single-phase	
Rating, kVA	2 @ 2,000 & 1 @ 2, 500	
Voltage, volts	2,300	

* Elevations given use PacifiCorp datum. Add 6.0 feet to convert to elevations per USC&GS mean sea level datum.